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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/747,703	12/29/2003	Herbert Brunner	12406-12001 / P2001,0463	5888
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FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER WILLIAMS, ALEXANDER O	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 11/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/747,703	Applicant(s) BRUNNER ET AL.	
	Examiner Alexander O. Williams	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-86 is/are pending in the application.
- 4a) Of the above claim(s) 4-6, 8-13 and 16-86 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/27/04 &amp; 12/29/03</u> . | 6) <input type="checkbox"/> Other: _____  |

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Serial Number: 10/747703    Attorney's Docket #: 12406-1200001/P2001,0463USN  
Filing Date: 12/29/2003; foreign priority to 6/29/2001

Applicant: Brunner et al.

Examiner: Alexander Williams

This application is a continuation of application # PCT/DE02/01514, filed 4/25, 2002.

Applicant's election with traverse of species I (claims 1, 2, 7, 14 and 15), filed 10/5/05, has been acknowledged.

This application contains claims 4-6, 8-13 and 16-86 drawn to an invention non-elected with traverse.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Receipt is acknowledged of papers submitted under 35 U.S.C. § 119, which papers have been placed of record in the file.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:  
A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by (Japan Patent # 311269).

1. (figure 1) show a surface-mountable radiation-emitting component, comprising: a leadframe 1,7 and a radiation-emitting chip 2 mounted on said leadframe; a molding material 8 encasing

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said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.

2. The component according to claim 1, figure 1 show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, figure 1 show wherein said first predetermined angle has a value of substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, figure 1 show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, figure 1 show wherein said radiation-emitting chip contains a compound selected from the group consisting of GaN, InGaN, AlGaN, InAlGaN, ZnS, ZnSe, CdZnS and CdZnSe.

15. The component according to claim 1, figure 1 show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Shunichi (Japan Patent # 57-169281).

1. Shunichi (the figure) show a surface-mountable radiation-emitting component, comprising: a leadframe 1 and a radiation-emitting chip 2 mounted on said leadframe; a molding material 4 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.

2. The component according to claim 1, Shunichi show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Shunichi show wherein said first predetermined angle has a value of substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, Shunichi show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Shunichi show wherein said radiation-emitting chip contains a compound selected from the group consisting of GaN, InGaN, AlGaN, InAlGaN, ZnS, ZnSe, CdZnS and CdZnSe.

15. The component according to claim 1, SHunichi show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Eiji (Japan Patent # 07-169893).

1. Eiji (the figure) show a surface-mountable radiation-emitting component, comprising: a leadframe 4 and a radiation-emitting chip 2 mounted on said leadframe; a molding material 1 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.

2. The component according to claim 1, Eiji show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Eiji show wherein said first predetermined angle has a value of substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

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7. The component according to claim 1, Eiji show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Eiji show wherein said radiation-emitting chip contains a compound selected from the group consisting of GaN, InGaN, AlGaN, InAlGaN, ZnS, ZnSe, CdZnS and CdZnSe.

15. The component according to claim 1, Eiji show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ishinaga et al. (U.S. Patent # 5,942,770).

1. Ishinaga et al. (figures 1 to 11) specifically figure 1 show a surface-mountable radiation-emitting component, comprising: a leadframe 4,4',7 and a radiation-emitting chip 2a mounted on said leadframe; a molding material 6 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.



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2. The component according to claim 1, Ishinaga et al. show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Ishinaga et al. show wherein said first predetermined angle has a value of substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, Ishinaga et al. show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Ishinaga et al. show wherein said radiation-emitting chip contains a compound selected from the group consisting of GaN, InGaN, AlGaN, InAlGaN, ZnS, ZnSe, CdZnS and CdZnSe.

15. The component according to claim 1, Ishinaga et al. show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(e) as being anticipated by Waitl et al. (U.S. Patent # 6,432,745 B1).

1. Waitl et al. (figures 1 to 4) specifically figure 3 show a surface-mountable radiation-emitting component, comprising: a leadframe 3 and a radiation-emitting chip 1 mounted on said leadframe; a molding material 2 encasing said leadframe and said

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radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.

2. The component according to claim 1, Waitl et al. show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Waitl et al. show wherein said first predetermined angle has a value of substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, Waitl et al. show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Waitl et al. show wherein said radiation-emitting chip contains a compound selected from the group consisting of GaN, InGaN, AlGaN, InAlGaN, ZnS, ZnSe, CdZnS and CdZnSe.

15. The component according to claim 1, Waitl et al. show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Brunner et al. (U.S. Patent # 5,981,979).

1. Brunner et al. (figures 1 to 11) specifically figure 4 show a surface-mountable radiation-emitting component, comprising: a leadframe 3,4 and a radiation-emitting chip 22 mounted on said leadframe; a molding material 1 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.

2. The component according to claim 1, Brunner et al. show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Brunner et al. show wherein said first predetermined angle has a value of substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, Brunner et al. show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Brunner et al. show wherein said radiation-emitting chip contains a compound

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selected from the group consisting of GaN, InGaN, AlGaIn, InAlGaIn, ZnS, ZnSe, CdZnS and CdZnSe.

15. The component according to claim 1, Brunner et al. show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Waitl et al. (U.S. Patent # 5,035,483).

1. Waitl et al. (figures 1 to 6) specifically figure 1 show a surface-mountable radiation-emitting component, comprising: a leadframe 2,3 and a radiation-emitting chip 4 mounted on said leadframe; a molding material 8,9 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.

2. The component according to claim 1, Waitl et al. show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Waitl et al. show wherein said first predetermined angle has a value of

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substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, Waitl et al. show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Waitl et al. show wherein said radiation-emitting chip contains a compound selected from the group consisting of GaN, InGaN, AlGaIn, InAlGaIn, ZnS, ZnSe, CdZnS and CdZnSe.

15. The component according to claim 1, Waitl et al. show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Hohn et al. (U.S. Patent # 6,006,861).

1. Hohn et al. (figures 1 to 8) specifically figure 3 show a surface-mountable radiation-emitting component 1, comprising: a leadframe 2,3 and a radiation-emitting chip 1 mounted on said leadframe; a molding material 5,8,9 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material

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and having connection surfaces enclosing a second predetermined angle with said mounting surface.

(62) To improve the mixing of the radiation emitted by an electroluminescing semiconductor body with the radiation converted by the luminous substance and thus to improve the homogeneity of color of the light emitted by the component, in an advantageous feature of the casting composition according to the invention a blue-luminescing colorant, which attenuates a so-called directional characteristic of the radiation emitted by the semiconductor body. The term "directional characteristic" is understood to mean that the radiation emitted by the semiconductor body has a preferential emission direction.

(6) FIG. 3 illustrates a particularly advantageous and preferred embodiment of the invention. The first and second electrical terminals 2, 3 are embedded in an opaque, and optionally prefabricated, basic housing 8 that has a recess 9. The term "prefabricated" is understood to mean that the basic housing 8 is already finished at the terminals 2, 3, for instance by means of injection molding, before the semiconductor body is mounted on the terminal 2. The basic housing 8, by way of example, is formed of opaque plastic, and in terms of its form the recess 9 is embodied as a reflector 17 for the radiation emitted by the semiconductor body in operation (the reflection optionally being achieved by means of suitable coating of the inside walls of the recess 9). Such basic housings 8 are used in particular for LEDs that are surface-mounted on printed circuit boards. They are applied, before mounting of the semiconductor body, to a conductor strip (lead frame) that has the electrical terminals 2, 3, the application for instance being done by injection molding.

(13) FIGS. 6-8 illustrate emissions spectra. FIG. 6 refers to a semiconductor body that emits blue light (luminescence maximum at  $\lambda$ ..about.430 nm) and FIGS. 7 and 8 refer to semiconductor components that emit white light. In each case, the wavelength  $\lambda$ . is plotted in nm on the abscissa, and a relative electroluminescence (EL) intensity is plotted on the ordinate.

(14) Of the radiation emitted by the semiconductor body in FIG. 6, only some is converted into a longer-wavelength range, so that white light is created as the mixed color. The dashed line

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30 in FIG. 7 represents an emissions spectrum of a semiconductor component which emits radiation comprising two complementary wavelength ranges (blue and yellow) and thus emits combined white light. The emissions spectrum here has one maximum each at wavelengths between approximately 400 and approximately 430 nm (blue) and between approximately 550 and 580 nm (yellow). The solid line 31 represents the emissions spectrum of a semiconductor component that mixes the color white from three wavelength ranges (additive color triad comprising blue, green and red). The emissions spectrum here has one maximum each for the wavelengths of approximately 430 nm (blue), approximately 500 nm (green) and approximately 615 nm (red).

2. The component according to claim 1, Hohn et al. show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Hohn et al. show wherein said first predetermined angle has a value of substantially **0.degree.** or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, Hohn et al. show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Hohn et al. show wherein said radiation-emitting chip contains a compound selected from the group consisting of **GaN**, InGaN, AlGaN, InAlGaN, ZnS, ZnSe, CdZnS and CdZnSe.

FIG. 6 is a graph of an emission spectrum of a semiconductor body that emits blue light, with a layer sequence on the basis of GaN;

15. The component according to claim 1, Hohn et al. show wherein said radiation-emitting chip is configured to emit

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radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

Claims 1 to 3, 7, 14 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Reeh et al. (U.S. Patent # 6,576,930 B2).

1. Reeh et al. (figures 1 to 14) specifically figure 2 show a surface-mountable radiation-emitting component, comprising: a leadframe 2,3 and a radiation-emitting chip 1,7 mounted on said leadframe; a molding material 15 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle relative to a main emission direction of the component; said leadframe having leadframe connections protruding out of said molding material and having connection surfaces enclosing a second predetermined angle with said mounting surface.

(17) The semiconductor component according to the invention has the particular advantage that the wavelength spectrum generated by way of luminescence conversion and hence the color of the radiated light do not depend on the level of the operating current intensity through the semiconductor body. This has great significance particularly when the ambient temperature of the semiconductor component and, consequently, as is known, also the operating current intensity greatly fluctuate. Especially light-emitting diodes having a semiconductor body based on GaN are very sensitive in this respect.

(54) In a preferred refinement of the semiconductor component according to the invention, the inorganic luminescent material is used in powder form for the above-mentioned purpose of thorough mixing of the emitted radiation, the luminescent material particles not dissolving in the substance (matrix) encapsulating them. In addition, the inorganic luminescent material and the substance encapsulating it have mutually



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different refractive indices. This advantageously leads to a portion of the light which is not absorbed by the luminescent material being scattered, in a manner dependent on the particle size of the luminescent material. The directional characteristic of the radiation radiated by the semiconductor body is thereby efficiently attenuated, with the result that the unabsorbed radiation and the luminescence-converted radiation are homogeneously mixed, which leads to a spatially homogeneous color perception.

(58) It is particularly advantageous that the luminous efficiency of white-light-emitting semiconductor components according to the invention and their above-mentioned embodiments having a blue-light-emitting semiconductor body produced essentially on the basis of GaN is comparable with the luminous efficiency of an incandescent bulb. The reason for this is that, on the one hand, the external quantum efficiency of such semiconductor bodies is a few percent and, on the other hand, the luminescence efficiency of organic dye molecules is often established at more than 90%. Furthermore, the semiconductor component according to the invention is distinguished by an extremely long life, greater robustness and a smaller operating voltage in comparison with the incandescent bulb.

(12) In the exemplary embodiment illustrated in FIG. 3, the first and second electrical terminals 2, 3 are embedded in an opaque, possibly prefabricated base housing 8 having a recess 9. "Prefabricated" is to be understood to mean that the base housing 8 is already preconstructed on the connections 2, 3, for example by means of injection molding, before the semiconductor body is mounted on to the connection 2. The base housing 8 is composed for example of an opaque plastic and the recess 9 is designed, in respect of its shape, as a reflector 17 for the radiation emitted by the semiconductor body during operation (if appropriate by suitable coating of the inner walls of the recess 9). Such base housings 8 are used in particular in the case of light-emitting diodes which can be surface-mounted on printed circuit boards. They are applied to a lead frame having the electrical terminals 2, 3, for example by means of injection molding, prior to the mounting of the semiconductor bodies.

(26) FIGS. 7, 8 and 12 respectively show emission spectra of a blue-light-radiating semiconductor body (FIG. 7) (luminescence maximum at  $\lambda_{\text{app}} \approx 430 \text{ nm}$ ) and of white-light-emitting semiconductor components according to the invention which are

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produced by means of such a semiconductor body (FIGS. 8 and 12). The wavelength  $\lambda$  in nm is plotted in each case on the abscissa and a relative electroluminescence (EL) intensity is in each case plotted on the ordinate.

(27) Only part of the radiation emitted by the semiconductor body according to FIG. 7 is converted into a wavelength range of longer wavelength, with the result that white light is produced as mixed color. The dashed line 30 in FIG. 8 represents an emission spectrum of a semiconductor component according to the invention which emits radiation from two complementary wavelength ranges (blue and yellow) and hence white light overall. In this case, the emission spectrum has a respective maximum at wavelengths of between approximately 400 and approximately 430 nm (blue) and of between approximately 550 and approximately 580 nm (yellow). The solid line 31 represents the emission spectrum of a semiconductor component according to the invention which mixes the color white from three wavelength ranges (additive color triad formed from blue, green and red). In this case, the emission spectrum has a respective maximum for example at the wavelengths of approximately 430 nm (blue), approximately 500 nm (green) and approximately 615 nm (red).

2. The component according to claim 1, Reeh et al. show wherein said leadframe connections, viewed from said mounting surface, are led laterally out of said molding material.

3. The component according to claim 1, Reeh et al. show wherein said first predetermined angle has a value of substantially 0.degree. or lies within a range from 0.degree. to 20.degree..

7. The component according to claim 1, Reeh et al. show wherein said leadframe connections extend up to a mounting plane defined by said mounting surface.

14. The component according to claim 1, Reeh et al. show wherein said radiation-emitting chip contains a compound selected from the group consisting of GaN, InGaN, AlGaN, InAlGaN, ZnS, ZnSe, CdZnS and CdZnSe.

(4) An example of a suitable layer sequence 7 for this and for all of the exemplary embodiments described below is shown in

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FIG. 9. There, a layer sequence made of an AlN or GaN layer 19, an n-conducting GaN layer 20, an n-conducting Ga.sub.x Al.sub.1-x N or Ga.sub.x In.sub.1-x N layer 21, a further n-conducting GaN or a Ga.sub.x In.sub.1-x N layer 22, a p-conducting Ga.sub.x Al.sub.1-x N layer or Ga.sub.x In.sub.1-x N layer 23 and a p-conducting GaN layer 24 is applied on a substrate 18 composed of SiC, for example. A respective contact metallization layer 27, 28 is applied on a main surface 25 of the p-conducting GaN layer 24 and a main surface 26 of the substrate 18, said contact metallization layer being composed of a material which is conventionally used for electrical contacts in opto-semiconductor technology.

15. The component according to claim 1, Reeh et al. show wherein said radiation-emitting chip is configured to emit radiation selected from the group consisting of visible light, infrared radiation, and ultraviolet electromagnetic radiation.

The listed references are cited as of interest to this application, but not applied at this time.

Field of Search	Date
U.S. Class and subclass: 257/99,100,81,89,603,103,788 313/486,467,512,498,113 372,45,46,43, 252/301.36 250/552	10/30/05
Other Documentation: foreign patents and literature in 257/99,100,81,89,603,103,788 313/486,467,512,498,113 372,45,46,43, 252/301.36 250/552	10/30/05
Electronic data base(s): U.S. Patents EAST	10/30/05

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O. Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30AM-7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272 1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexander O Williams  
Primary Examiner  
Art Unit 2826

AOW  
10/30/05